STARS ACADEMY LAHORE

MULTAN CAMPUS

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STARS ENTRY TEST SYSTEM-2019
(Session-MDCAT)

Test Code: CTS-02 **Time Allowed: 150 mins**

BIOLOGY

1. **The specific heat of vaporization of water is _______ Kcal/kg:**
A) 374 B) 474 C) 574 D) 674

2. **The inhibitor which closely resembles the substrate in its molecular structure and inhibits the enzyme activity by binding to the active site of the enzyme is called**
A) feedback inhibitor C) Competitive inhibitor
B) Non – competitive inhibitor D) Allosteric modulator.

3. **Triglycerides are fatty acid esters of glycerol, which are formed of _____ molecule(s) of fatty acids and ______ molecule(s) of glycerol.**
A) One, two B) One three C) Three, one D) Two, one

4. **Polypeptide bends & folds upon itself forming a globular shape in which structure?**
A) Tertiary B) Secondary C) Primary D) Quaternary

5. **For the synthesis of 10g of glucose ______ of energy is required:**
A) 717.6 Kcal B) 737 Kcal C) 727 Kcal D) 747 Kcal

6. **These are rare in nature and occur in some bacteria:**
A) Glucose B) Ribulose C) Erythrose D) Ribose

7. **The bond formed between glucose and fructose in sucrose is:**
A) 1,4 Glycosidic Linkage C) 1,6 Glycosidic Linkage
B) 1,2 Glycosidic Linkage D) 1,3 Glycosidic Linkage

8. **Which one are intermediates in respiration and photosynthesis both?**
A) Ribose and heptolose C) Glucose and galactose
B) Glyceraldehydes and dihydroxyacetone D) Fructose and ribulose

9. **Protein is described by biologists at ________ levels.**
A) 1 B) 2 C) 3 D) 4

10. **Number of peptide bonds involved in maintenance of primary structure of each beta chain of hemoglobin is:**
A) 146 B) 145 C) 144 D) 143

11. **The proteins, which regulate metabolic activities are:**
A) Hormones B) Enzymes C) Antibodies D) Carrier

12. **Sucrose (cane sugar) is a disaccharide. One molecule of sucrose on hydrolysis gives______.**
A) 2 molecules of glucose
B) 2 molecules of glucose + 1 molecule of fructose
C) 1 molecule of glucose + 1 molecule of fructose
D) 2 molecules of fructose

13. **Cellulose gives ______ color with iodine:**
A) Red B) No C) Blue D) Green

14. **The inhibitors that bind tightly and permanently to enzymes and destroy their globular structure and catalytic activity are:**
A) Reversible inhibitors C) Competitive inhibitors
B) Irreversible inhibitors D) Non-competitive inhibitors

15. **Enzyme succinate dehydrogenase converts succinate into**
A) Malate B) Malonic acid C) Citrate D) Fumarate

16. **_________ the reaction rate is directly proportional to the substrate available:**
A) At high conc. of substrate C) At low conc. of substrate
B) At high conc. of enzyme D) At low conc. of enzyme

17. **The enzymes important in photosynthesis are found in:**
A) Mitochondria B) Chloroplast C) Ribosomes D) Golgi apparatus

18. **Cofactor (prosthetic group) is a part of holoenzyme. It is**
A) Loosely attached inorganic part

B) Accessory non – protein substance attached firmly
C) Loosely attached organic part
D) None of these

19. Which is not true for enzymes
A) Enzyme is a complex structure of protein
B) Enzyme can be regulated by specific molecules
C) Enzyme is more sensitive for the changes of temperature and pH
D) Enzyme functions as catalyst for various reactions

20. At 25ºC the concentration of each H+ and OH- ions in pure water is about ………..mole/liter?
A) 10^{-5} B)10^{-6} C) 10^{-7} D) 10^{-8}

21. In glycogen, which kind of linkage is found between adjacent glucose molecules?
A)1, 4 Glyosidic linkage C) 1, 2 Glyosidic linkage
B) 1, 6 Glyosidic linkage D) Both A and B

22. How many types of amino acids are found in cells and tissues for protein synthesis?
A) 180 B) 45 C) 20 D) 170

23. The substance, which is metal ion essential for the normal functioning of enzyme is called
A) Cofactor B) Coenzyme C) Holoenzym D) None of these

24. Which of the following is the example of structural protein?
A) Myosin B) Collagen C) Keratin D) All of these

25. Arrange the steps of catalytic action of an enzyme in order and choose the correct option.
I. The enzyme releases the products of the reaction and the enzyme is free for another substrate.
II. The active site of enzyme is in close proximity of the substrate and breaks of chemical bonds of the Substrate.
III. The binding of substrate induces the enzyme to alter its shape fitting more tightly around the Substrate.
IV. The substrate binds to the active site of the enzyme fitting into the active site.
A) IV, III, II, I C) II, I, IV, III
B) III, II, I, IV D) III, IV, I, II

26. If all the peptide bonds of protein are broken, then the remaining part is
A) Amide B) Peptones C) Polypeptide D) Amino acid

27. Which one of the following is not true for enzymes?
A) They act on a specific substrate. C) They act at a specific temperature.
B) They are made up of fat and sugar D) They act at a specific pH.

28. The polysaccharides made up of glucose monomers are
A) Sucrose, lactose, maltose C) Starch, glycogen, cellulose
B) Starch, inulin, peptidoglycan D) Both A & C

29. Each polypeptide in a protein has amino acids linked with each other in a specific sequence. This sequence of amino acids is said to be _________.
A) Primary structure of proteins C) Tertiary structure of proteins.
B) Secondary structure of proteins. D) Quaternary structure of proteins.

30. Over 50% of the total dry weight of a cell consists of:
A) Lipids B) Proteins C) Carbohydrates D) Nucleic acids

31. In an aqueous environment the most stable tertiary conformation is that in which ______ amino acids are buried inside the conformation.
A) Hydrophobic C) Hydrophilic
B) Basic D) None of these

32. Movement of organs and organisms and movement of chromosomes during anaphase of cell division, are caused by:
A) Carbohydrates B) Proteins C) Lipids D) Nucleic acids

33. Both glucose and fructose are hexoses, glucose makes a ______ whereas fructose make a _______ in a solution, respectively:
A) Pyran, Pyran B) Furan, Furan C) Furan, pyran D) Pyran, Furan

34. Which of following is an example of phospholipid?
A) Palmitic acid B) oleic Acid C) Lecithin D) Glycerol

35. In deoxyribose oxygen atom is removed from carbon number:
A) 1 B) 3 C) 2 D) 4

36. Active site by virtue of its flexibility becomes complementary to substrate
A) Induced fit model C) Lock and key model
B) Emil Fischer's proposal D) Both B & C

37. It has optimum pH of 9.0
A) Pancreatic lipase B) Chymotrypsin C) Arginase D) Catalase

38. Which step causes activation of catalytic site of an enzyme?
A) Change in pH of the surroundings C) Formation of Enzyme Substrate complex

B) Change in the charge of the active site D) Change in temperature

39. **Amylose starches have unbranched chains of______and are______in hot water:**
A) Glucose, soluble C) Ribose, soluble
B) Glucose, insoluble D) Ribose, insoluble

40. **Which of the following is a stored form of energy in plant?**
A) Starch B) Cellulose C) Glycogen D) Chitin

41. **Lipids are**
A) Compounds of carbon, hydrogen and oxygen
B) Compounds of glycerol and fatty acid
C) Insoluble in water
D) All of these

42. **Which of the following statement is incorrect for fats containing unsaturated fatty acid?**
A) They contain double bond C) They are usually solid at room temperature
B) They are lighter than water D) Their specific gravity is less than 1

43. **9.70 is the optimum PH for:**
A) Arginase B) Chymotrypsin C) Pancreatic lipase D) Salivary Amylase

44. **Silk fiber is a:**
A) Globular protein B) Functional protein C) Fibrous protein D) soluble protein

45. **The most common type of lipids is:**
A) Waxes B) Phospholipids C) Triglycerides D) Terpenoids

46. **Phospholipids are derivatives of:**
A) Phosphatidic acid C) Lecithin
B) Phosphatidylcholine D) Phosphatidylserine

47. **To make a peptide bond one amino acid loses ______ and other loses _______:**
A) N, OH B) H_2O,OH C) H, H_2O D) OH, H

48. **Which of the following organic compounds are classified as lipids? (1) Polysaccharides (2) Triglycerides (3) Steroids (4) Enzymes**
A)1 & 2 B)2 & 3 C)3 & 4 D)1 & 4

49. **Which biomolecule has most of the carbon of biosphere?**
A) Chitin B)Starch C)Cellulose D)Glycogen

50. **Dextrins are:**
A)Proteins B)Lipids C)Derived proteins D)Carbohydrates

51. **In carbohydrates, hydrogen and oxygen are mostly found in the ration of:**
A)1:2 (b)3:1 C)2:1 D)1:3

52. **One which Is not the true polymer of its monomers:**
A) Carbohydrates B) Proteins C) Lipids D) None of these

53. **Phosphatidic acid is composed of:**
A)2 glycerol, 2 fatty acids & 1 phosphoric acid C)1 glycerol, 2 fatty acids & 1 phosphoric acid
B)2 glycerol/1 fatty acids & 1 phosphoric acid D)2 glycerol, -1 fatty acids. & 2 phosphoric acid

54. **Which about hemoglobin chains is not true?**
A)it contains 4 polypeptide chains B)it consists of 571 amino acids
C)Each β-chain contains 146 amino acids D)it is a protein

55. **______is an important type of simple sugar molecule that is found in the human bloodstream:**
A)Glucose B)Fructose C)Glucagon D)Glucosamine

56. **The most important structure in hemoglobin would be:**
A)Primary B)Secondary C)Tertiary D)Quaternary

57. **A dipeptide has:**
A)2 amino acids and 1 peptide bond C)2 amino acids and 3 peptide bonds
B)2 amino acids and 2 peptide bonds D)2 amino acids and 4 peptide bonds

58. **Fibrous protein such as silk consists of polypeptide chains arranged in:**
A)α-helix B)β-pleated sheet C)β-helix D)None of these

59. **The sequence of atoms in a peptide bond is:**
A)-C-N-N-C- B)-C-C-N-C- C)-C-C-C-N- D)-N-OC-C-

60. **The insulin has two polypeptide chains α& β . The number of amino acids in each chain is:**
A)α=21, β=30 B)α=30, β=21 C)α=141, β=146 D)α=146, β=141

61. **How many carbon atoms are outside in pyranose ring?**
A) 5 atom B) 3 atom C) 6 atom D) 1 atom

62. **Which term describes both collagen and haemoglobin?**
A) enzymes B) fibrous proteins C) globular proteins D) macromolecules

63. **What type of chemical reaction is involved in the formation of disulfide bonds?**
A) condensation B) hydrolysis C) oxidation D) reduction

64. **The function of glycogen in living things is:**
A) energy storage C) storage of genetic information
B) structural support D) movement/motility

65. The formation of large molecules from small repeating units is accomplished by a ______ reaction.

A) oxidation B) reduction C) dehydration D) hydrolysis

66. Which of the following includes all the others?

A) glucose B) cellulose C) glycogen D) carbohydrate

67. All of the following are considered “weak” interactions in proteins, except:

A) hydrogen bonds. C) ionic bonds

B) hydrophobic interactions. D) peptide bonds.

68. In the α helix the hydrogen bonds:

A) are roughly parallel to the axis of the helix

B) are roughly perpendicular to the axis of the helix.

C) occur mainly between electronegative atoms of the R groups

D) occur only between some of the amino acids of the helix.

69. In an α helix, the R groups on the amino acid residues:

A) alternate between the outside and the inside of the helix

B) are found on the outside of the helix spiral.

C) cause only right-handed helices to form.

D) generate the hydrogen bonds that form the helix

70. The structural classification of proteins is based primarily on their:

A) amino acid sequence C) subunit content and arrangement.

B) function. D) secondary structure content and arrangement.

71. Which of the following is a characteristic of lipids?

A) They are composed of nitrogenous chains C) they are either fats or oil

B) They are not soluble in water D) They are polar molecule

72. How many possible double bonds may be present in fatty acids?

A) Two B) Four C) Three D) Six

73. A mono-unsaturated fatty acids having C 18, what is the formula

A)$C_{18}H_{35}COOH$ C)$C_{17}H_{33}CO0H$

B)$C_{17}H_{35}CO0H$ D)$C_{18}H_{33}COOH$

74. Which is an aldo sugar ?

A) Dihydroxyacetone B) Ribulose C) Glyceraldehyde D) Both B & C

75. A fatty acid is a compound made of a chain of carbon atoms plus

A) An acid group at one end C) An amino group

B) Acid group at both ends D) Amino group at both ends

76. Which leads to the formation of E-S complex

A) Binding site B) Catalytic site C)both a and b D) Allosteric site

77. All the active sites of the enzyme are occupied

A) At high enzyme conc C) At low temp

B) At high substrate level D) At low substrate level

78. Select the sequence of biological organic molecules which are found in abundance?

A) Water > Proteins > Lipids > Carbohydrates > DNA

B) Proteins > Lipids > Carbohydrates > DNA

C) Proteins > Carbohydrates > Lipids > DNA

D) Proteins > Lipids > Carbohydrates > RNA

79. In lock and key model …… act as key?

A) Substrate B) Enzyme C) Inhibitors D) Co-factor

80. Two classes of organic compound typically provide energy for living system, representatives of these two classes are :

A) Fats and amino acids C) Amino acids and ribose sugar

B) Amino acids and glycogen D) Fats and polysacchrides

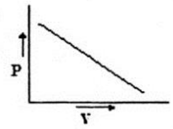
CHEMISTRY

81. Volume is directly proportional to moles of a gas at the given conditions. This is called as
A) Dalton's law B) Graham's law C) Avogadro's law D) Boyle's law

82. There is a temperature change from 20° C to 0°C. The final temperature on Fahrenheit scale is:
A) 32°F B) 0° F C)36°F D) 68° F

83. Which one of following gases behave the most ideal under the identical conditions
A) $S0_2$ B) $C0_2$ C) Cl_2 D) N_2

84. Among the plots of P vs V for ideal gas at constant T, given below which one corresponds to Boyle's law?

A)


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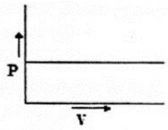

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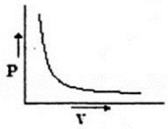
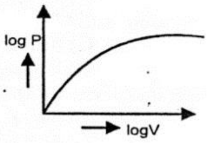


D)


85. Absolute zero is the temperature at which different gases are expected to have
A) minimum volume C) zero volume
B) effective volume D) maximum volume

86. Helium atom is two times heavier than a hydrogen molecule. At 298 K, the average K.E. of Helium is?
A) 2 times of H_2 molecules C) Same as that of H_2 molecules
B) 4 times of H_2 molecules D) ½ that of H_2 molecules

87. How should the conditions be changed to prevent the volume of a gas from expanding when its mass is increased
A) Temperature is lowered and pressure is increased
B) Temperature is increased and pressure is lowered
C) Temperature and pressure both are lowered
D) Temperature and pressure both are increased

88. The product PV of a gas has same units as of
A) Force B) Work C) Pressure D) Temperature

89. Layers of carbon atoms in graphite are held together by
A) Coordinate covalent bonds C) Covalent bonds
B) Van der Waal's forces D) Ionic bonds

90. The compressibility factor for ideal gas is
A) 1.5 B) 1.0 C) 2.0 D) ∞

91. Suppose the value R is 6.023×10^{23} and the temperature of gas is 8K. then average translational kinetic energy of gas
A) 6J B) 9J C) 12J D) 15J

92. In which of the following hydrogen bonding will be more effective
A) Ethanol C) Hydro fluoric acid
B) Diethyl ether D) Water

93. The pressure exerted by the gas is 3.0 atm and due to intermolecular force pressure reduced is 0.2 atm then ideal pressure of gas is_
A) 2.8 atm B) 3.0 atm C) 3.2 atm D) 4.2 atm

94. Observed pressure is almost equal to ideal pressures for a real gas if Van der Waals constants
A) 'a' is small and 'b' is large C) both 'a' and 'b' are small
B) both 'a' and 'b' are large D) 'a' is large and 'b' is small

95. Which of the following is crystalline solid?
A) Rubber B) Sugar C) Glass D) Glue

96. Calculate the pressure exerted by 32g Marsh gas (CH_4) having volume 546cm^3 at 0°C (R=0.0821atm dm^3/mol K)
A) 0.821 atm B) 0.0821 atm C) 0.1642 atm D) 82.1 atm

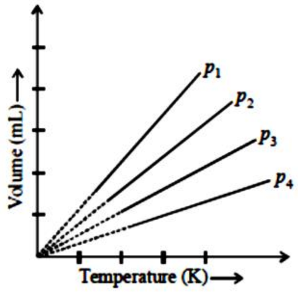
97. Following properties of liquids will change with change in temperature except
A) Molecular mass B) Evaporation C) Density D) Vapour pressure

98. In most of the cases the molecular crystals are
A) Soft B) Extremely hard C) Sublimable D) Conductors

99. Dry ice (carbon dioxide) forms

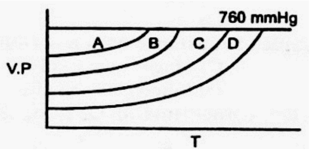
A) Ionic crystals C) Metallic crystals
B) Covalent crystals D) Molecular crystals

100. A plot of volume (V) vs. temperature (T) for a gas at constant pressure is a straight line. The plot at different values of pressure are shown in fig. which of the following order for pressure is correct for the gas?



A) $p_1 > p_2 > P_3 > p_4$ C) $p_1 = p_2 = P_3 = p_4$
B) $p_1 < p_2 < P_3 < p_4$ D) $p_1 > p_2 < P_3 > p_4$

101. In the following diagram



Which curve represents liquid with lowest boiling point at 760 mmHg,
A) A B) B C) C D) D

102. Which of the following has maximum boiling point?
A) Ethanol B) Water C) Glycerol D) Ethylene glycol

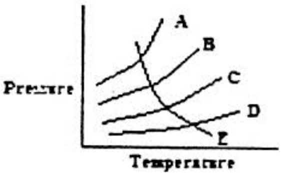
103. Atmospheric pressure recorded in different cities are as follows. In which city the B.P. of water will be minimum?

City	**P in N/m^2**
Murree	**0.98×10^5**
Karachi	**1.01×10^5**
Multan	**1.2×10^5**
Lahore	**1.02×10^5**

A) Murree B) Multan C) Karachi D) Lahore

104. Vapour pressure is not affected by
A) Nature of liquid C) Intermolecular forces
B) Temperature D) Amount of liquid

105. On the basis of vapour pressure temperature diagram given below.



Which one is incorrect?
A) A & E B) Only D C) Only E D) B & D

106. Reducing the pressure from 1.0 atm to 0.5 atm would change the no. of molecules in one mole of ammonia to?
A) 25% of its initial value C) 50% of its initial value
B) 75% of its initial value D) None of the above

107. In a closed flask of 5dm^3, 1.0 g of H_2 is heated from 300 K to 600 K. Which statement is incorrect
A) Pressure of the gas increases C) The rate of collision increases
B) The number of moles of gas increases D) The energy of gaseous molecules increase

108. Mention the correct order of strength of forces
A) Dipole-dipole>London forces >hydrogen bonding
B) H-bonding> dipole-dipole>London forces
C) London forces>H-bonding> dipole-dipole
D) H-bonding> London forces> dipole-dipole

109. Which one of the following conditions makes the real gases ideal?
A) High temperature and low pressure C) Low temperature and low pressure
B) Low temperature and high pressure D) High temperature and high pressure

110. Which solid does not contain covalent bonds
A) Copper B) Graphite C) Diamond D) Ice

111. Melting point of water is higher than petrol, because intermolecular forces in water are:

A) Weaker than petrol C) Same as in petrol
B) Stronger than petrol D) Negligible

112. The coordination number of Na^+ in NaCl crystal is:
A) 6 B) 2 C) 4 D) 8

113. A solid melt slightly above 273 K and is a poor conductor of heat and electricity, may be soluble in polar or nonpolar solvent, belongs to
A) Ionic solid C) Covalent solid
B) Molecular D) Metallic solid

114. Which gas has highest value of 'a' (coefficient of attraction)?
A) He B) Ne C) Kr D) Ar

115. A gas at 1atm pressure is cooled from 273°C to 0°C at constant volume. Then new pressure will be:
A) ½atm B) 2atm C) 273atm D) 4atm

116. If 300 mL of a gas at 27ºC is cooled to 7ºC at constant pressure, its final volume will be?
A) 135 mL B) 350 mL C) 450 mL D) 280 mL

117. When the temperature of an ideal gas is increased from 27ºC to 927ºC, then Its kinetic energy will be
A) Same B) Two times C) Four times D) Sixteen times

118. The forces of attraction in liquid hydrogen chloride are expected to be
A) dipole-dipole C) Debye
B) ion-dipole D) dipole-induced dipole

119. Highest rate of diffusion is shown by
A) SO_2 B) $C\ell_2$ C) CO_2 D) N_2

120. The volume of $16dm^3$ of methane when its temperature is increased from 200K to 400K.
A) $32\ dm^3$ B) $48\ dm^3$ C) $16\ dm^3$ D) $64\ dm^3$

121. The temperature beyond which a gas cannot be liquefied even by increasing the pressure is:
A) Standard temperature C) Critical temperature
B) Triple point D) All of these

122. A fire extinguisher deliver 1.1kg of CO_2. The Volume of CO_2 at STP is;
A) $\approx 1100\ dm^3$ B) $\approx 1300\ dm^3$ C) $\approx 550\ dm^3$ D) $\approx 1000\ dm^3$

123. If absolute temperature is doubled and pressure is increased four times, the volume of the ideal gas;
A) remains unchanged C) becomes half
B) becones $\frac{1}{4}$ th D) becomes four times

124. At higher temperature isotherm moves away from both the axes because of increase in
A) density C) number of moles
B) volume D) all of these

125. Which one of the following is not a property of an ideal gas.
A) particles have negligible volume C) particles have zero mass
B) particles have no attractive forces D) The average K.E $\propto$ T

126. Gases deviate from ideal behavior because molecules?
A) are colorless C) Attract each other
B) contain covalent bonds D) show Brownian movement

127. Liquid which have low vapor pressure can be expected to have:
A) weak intermolecular forces C) high rate of evaporation
B) low boiling point D) high density.

128. A solid 'z' has following set of properties.
I. Very hard and giant solid
II. Insoluble in all solvents
III. Non conductor
What do you think, the type of solid 'Z' is;
A) Ionic solid C) Covalent solid
B) Molecular solid D) Metalic solid

129. Vapour pressure of a liquid remains constant;
A) by increasing temperature C) by changing polarity
B) by increasing amount of liquid D) by decreasing forces of attraction

130. Which one among the following does not have the hydrogen bond?
A) phenol B) liq. NH_3 C) liq. HCl D) Water

131. Which of the following is correct?
A) H_2O may boil at 120ºC C) H_2O boils at 98ºC, at 700 torr
B) H_2O may boil at 25ºC D) all are correct

132. To cook the food at a high mountain is difficult as compared to at sea level. The reason is that.
A) The hydrogen bonding in water changes with change in height
B) The density of water decreases at mountain
C) The boiling point of water decreases at mountain.

D) All are correct.

133. Which set of statements is true about the fact that ice floats on water.

$I.$ Structure of ice
$II.$ H. Bonding b/w H_2O molecules in ice
$III.$ Empty space b/w H_2O Molecules in ice
$IV.$ Change of bond angle in ice

A) I and II are correct
C) only III is correct
B) II and III are correct
D) All are Correct

134. If volume of an Ideal gas at 0°C is 546cm^3, What is Volume at 150°C?

A) 566 cm^3
B) 646 cm^3
C) 746 cm^3
D) 846 cm^3

135. A mixture of 64g each of SO_2 , O_3 , O_2 and CH_4 is taken in a cylinder. The correct order of their partial pressures is:

A) $SO_2 \rangle O_3 \rangle O_2 \rangle CH_4$
B) $SO_2 \rangle O_0 \rangle O_4 \rangle CH_4$
C) $CH_4 \rangle O_3 \rangle O_2 \rangle SO_2$
D) $CH_4 \rangle O_2 \rangle O_3 \rangle SO_2$

136. Which of the following exerts the highest pressure?

A) 1 Mol of N_2 at 0°C in 11.2 dm^3
C) 1 Mol of H_2 at 27°C in 1 dm^3
B) 1 Mol of N_2 at 27°C in 22.4 dm^3
D) 1 Mol of C_4H_{10} at its normal boiling point

137. When granulated Zn reacts with dil. H_2SO_4, hydrogen gas is given off. How does the volume of the hydrogen evolved, depend on temperature and pressure?

A) It increases with increase in temperature and is independent of pressure
B) It increase with decrease in temperature and is independent of pressure
C) It increases with increase in temperature and increases with increase in pressure.
D) It increases with increase in temperature and decreases with increase in pressure

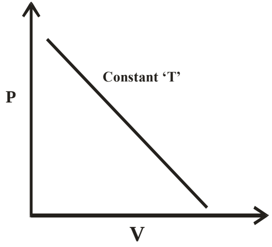
138. Which of the following exists as covalent crystals in the solid state?

A) Sulphur
B) Phosphorus
C) Iodine.
D) Silicon

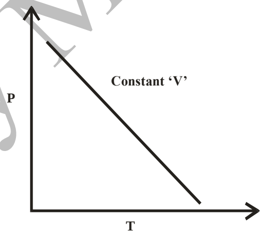
139. Which of the following liquid has the highest vapor pressure or is most volatile?

A) HF
B) NH_3
C) C_2H_5OH
D) H_2O

140. Which of the following describe correctly behavior of ideal gas?



A)



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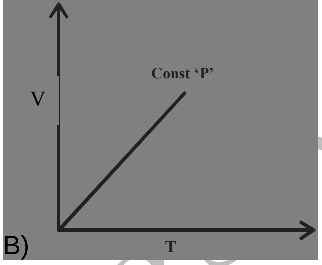

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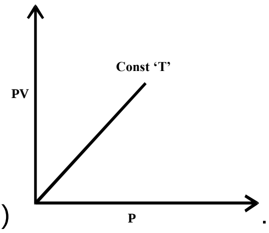

D)

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STAR Academy Multan Campus

PHYSICS

141. All the food that a person eat one day has about the same energy as of petrol
A) 1/2 liter B) 1/3 liter C) ¼ liter D) 1/5 litter

142. A body of mass 100 gm is rotating in a circular path of radius r with constant velocity. The work done in one complete revolution is
A) (r/100) J B) zero C) (100/r) J D) 100 rJ

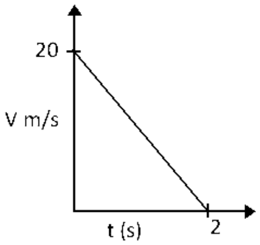
143. The relation between horse power and watt is
A) 1 hp = 546 watt B) 1 hp = 1000 watt C) 1 hp = 746 watt D) 1 hp = 946 watt

144. A field in which the work done in moving a body in a closed path is zero is called
A) electric field C) conservative field
B) electromagnetic field D) gravitational field

145. Work is done on the body when
A) force acts on it
B) it experiences an increase in energy through a mechanical influence
C) it moves through a certain distance
D)none of the above

146. The average power required to lift a 100kg mass through a height of 50 metres in approximately 50 seconds would be (in J/s)
A) 50 B) 100 C) 5000 D) 980

147. Velocity time graph of a particle of mass 2kg moving in a straight line is as shown in figure. Work done by all forces on the particle is



A) 400 J B) -200 J C) -400 J D) 200 J

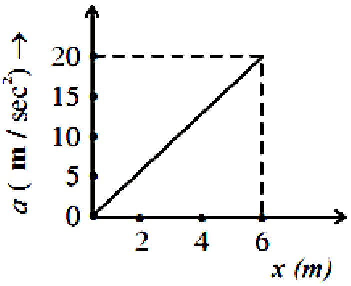
148. A car is moving with constant speed of 20 m/s against a resistance of 100N. The power exerted by the car is
A) 2 kW B) 200 W C) 5 W D)1 kW

149. Work done by variable force is determine by dividing
A) force into small interval
B) displacement into small interval
C) both force and displacement into small intervals
D) force into small and displacement into large intervals

150. If momentum decrease by 20 %, K.E of a body of mass m will be
A) 40% B) 36% C) 10% D) 8 %

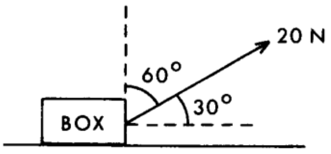
151. A person holds a bucket of weight 60N. He walks 7m along the horizontal and then climbs up a vertical distance of 5m. The work done by the man is
A) 720J B) 300J C) 420J D) all may be

152. A 8 kg mass moves along x-axis. Its accelerations as a function of its position is shown in the figure. What is the total work done on the mass by the force as the mass moves from x = 0 to x = 6m ?
A) 480 J
B) 98 x10^{-3} J
C) 4.8 x10^{-3} J
D) 4.8 x10^{3} J



153. Two objects of masses 3 kg and 2 kg move with velocities of 2 m/s and 3 m/s respectively. Their kinetic energies are in the ratio
A) 1 : 1 B) 3 : 2 C) 2 : 3 D) 9 : 4

154. A 20 N force acts on a box and moves it along x-axis as shown. Which of the following correctly shows the components of the force for work?
A) 20 cos30° N
B) 20 cos60° N
C) 20 sin60° N
D) Both A and C

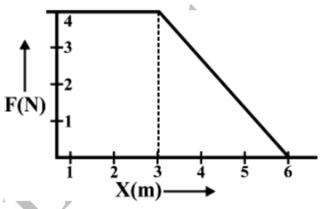


155. **The kinetic energy of a body is numerically equal to thrice the momentum of the body. The velocity of the body is:**
A) 2 units B) 6 units C) 3 units D) 9 units

156. **When a body dropped from certain height 'h' covers a distance x, velocity of body at this point is:**
A) $v = \sqrt{2gx}$ B) $v = \sqrt{2gh^2}$ C) $v = \sqrt{2g(h-x)}$ D) $v = \sqrt{2mgh}$

157. **A one kilowatt motor is used to pump water from a well 10 m deep. The quantity of water pumped out per second is nearly:**
A) 1 kg/s B) 100 kg/s C) 10 kg/s D) 1000 kg/s

158. **When a body dropped from certain height 'h' covers a distance x, P.E at this point is:**
A) mgx B) mg(h – x) C) mgh D) mg(x – h)



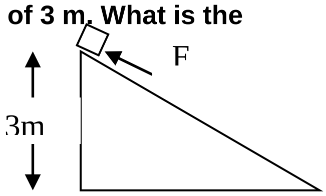
159. **A force F acting on an object varies with distance X as shown in fig. Calculate the work done by the force x = 3 to x= 6**
A) 18 J B) 12 J C) 6 J D) 9 J

160. **How much work is done by force** $\vec{F} = \left(5\hat{i} + 3j + 2k\right)N$ **which displaces body through** $\vec{d} = \left(2\hat{i} - j\right)m$
A) 10 J B) 7 J C) 13 J D) -13 J

161. **Two bodies are thrown vertically upwards with their initial speeds in the ratio 2:3. The ratio of the maximum heights attained by them is**
(a) $\sqrt{2} : \sqrt{3}$ (b) 4:9 (c) 2:3 (d) 1:1

162. **A ball falls from a height *h* from a tower. Which of the following statements is true?**
(A) The potential energy of the ball is conserved as it falls.
(B) The kinetic energy of the ball is conserved as it falls.
(C) The sum of & the difference between the potential energy& kinetic energy is a constant as the ball falls.
(D) The sum of the kinetic and potential energies of the ball is a constant.

163. **A 20-kg cart is pushed up the inclined plane shown by a force F to a height of 3 m. What is the potential energy of the cart when it reaches the top of the inclined plane?**



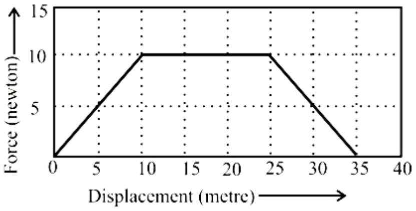
(A) 1500 J
(B) 630 J
(C) 600 J
(D) 300 J

164. **Drew lifts a 60-kg crate onto a truck bed 1meter high in 3 seconds. Connor lifts sixty kg box onto the same truck in a time of 2 minutes. Which of the following statements is true**?
(A) Drew does more work than Connor does.
(B) Connor does more work than Drew does.
(C) They do the same amount of work, but Drew operates at a higher power level.
(D) They do the same amount of work, but Connor operates at a higher power level.

165. **In an energy transformation, the energy output is 20 J, and the waste thermal energy is 80 J. The percent efficiency of the transformation is**
A) 20% B) 80% C) 60% D) 25%

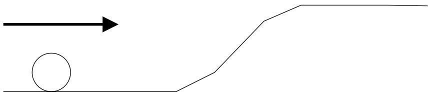
166. **If a rock falls from a cliff, at what point are its kinetic energy and its potential energy the same? Ignore air resistance. Assume the potential energy is relative to the bottom of the cliff.**
A) just as it starts to fall C) halfway down
B) just before it hits the bottom D) not enough information

167. **The figure shows force displacement graph of a moving body; the work done is displacing a body from x = 0 to x = 35 m is equal to**



A) 25 J
B) 50 J
C) 200 J
D) 250 J

168. **In the diagram, the ball's velocity is 6 m/s, and the height of the ramp is 1 m. What will the ball's velocity be at the top of the ramp? Ignore friction. The ball won't make it to the top of the ramp.**
A) 2 m/s
B) 3 m/s
C) 4 m/s



D) 5 m/s

169. A body at rest may have

A)Energy B)Momentum C) Speed D)Velocity

170. A motor boat is travelling with a speed of 3.0 m/sec. If the force on it due to water flow is 500 N, the power of the boat is

A)150 kW B)15 kW C)1.5 kW D)150 W

171. The kinetic energy of a body of mass 3 *kg* and momentum 2 *Ns* is

A)1 J B) $\frac{2}{3}J$ C) $\frac{3}{2}J$ (d)4 J

172. If $\vec{F} = 5\hat{i} + 3\hat{j} + 0\hat{k}$ and $\vec{d} = 3\hat{i} + 4\hat{j} + 6\hat{k}$ then component along which the work done is maximum?

A) Along x-axis B) Along y-axis
C) Along z-axis D)Equal in all directions

173. If the area under graph is ½ Fd, then the force doing work is

(A) Constant (B)Variable (C)Infinite (D) Zero

174. 1kWh = ______ GJ

(A) $3.6 \times 10^{+3}$ (B) 3.6×10^{-3} (C) $3.6 \times 10^{+6}$ (D) 3.6×10^{-6}

175. An electron and proton are brought close to each other from infinity. The potential energy of the system will

(A) Increase (C) Decrease
(B) Remain constant (D) First increase then decrease

176. To maximize the gravitational potential energy of an object, you should

A) raise it as quickly as possible
B) maximize the total distance travelled
C) avoid acceleration during lifting
D)get it as high as possible

177. Four particles have same momentum. Which has maximum kinetic energy?

A) Proton B) Deutron C) Electron D) α-particle

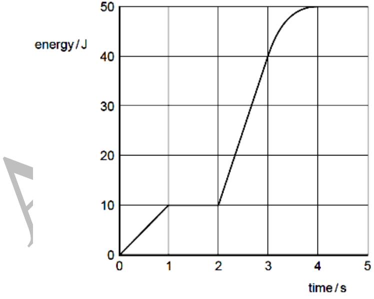
178. For which of the following work done the increase in kinetic energy is maximum?

A) 10 J B) 100 J) -100 J D) -150 J

179. If the unit of force and length each be increased by four times, then the unit of energy is increased by

A)16 times B)8 times C) 2 times D)4 times

180. An electrical generator is started at time zero. The total energy transformed by the generator during the first 5 seconds is as shown in the graph.



What is the minimum power generated at any instant during these first 5 seconds?

A) 10 W B) 30 W C)13 W D) 0 W

ENGLISH

Choose the correct word words to complete each sentence.

181. He was not sent to the juvenile court; instead he was _____________.
A) compelled B) cautioned C) crammed D) coaxed

182. The boy's weight and the weight of the purse combined __________ him to lose his balance.
A) Caused B) Had caused C) Causes D) Cause

183. "Then I won't turn you________", said the woman.
A) Lose B) Loosen C) Loss D) Loose

184. Rumours of job losses were later __________by the officials of the state.
A) induced B) engrossed C) confirmed D) cajoled

SPOT THE ERROR: In the following sentences some segments of each sentence are underlined. Your task is to identify that underlined segment of the sentence, which contains the mistake that needs to be corrected. Fill the circle corresponding to that letter under the segment in the MCQ Response Form.

185. Darts are being played by a cluster of players and they exhibit precision in their skill.
A B C D

186. He felt submerged in a chemical that can dissolve his intellect and burn away all his past.
A B C D

187. The boy became very impressed by the good conduct of the lady and promised to be a good boy.
A B C D

188. The analysis of teachers conclude that students must avoid slinging broadside on their classmates and
A B C
cultivate the spirit to tolerate one another.
D

189. The population of Pakistan is divided into two compartments: the haves and haves not.
A B C D

190. Wait, keep things going until the war ended and the rockets come again.
A B C D

In each of the following questions, four alternative sentences are given Choose the CORRECT one and fill the circle corresponding to that letter in the MCQ Response Form.

191.
A) The capable officer told that it was not her duty to give advice to those who create irritants.
B) The capable officer said that it was not her duty to give a piece of advices to those who create irritants.
C) The capable officer said that it was not her duty to give an item of advice to those who creates irritants.
D) The capable officer said that it was not her duty to give a piece of advice to those who create irritants.

192.
A) Clamorous and dissenting voices of the law makers show that the parliament is divided on the bill.
B) Clamorous and dissenting voices of the law makers show that the parliament were divided on the bill.
C) Clamorous and dissenting voices of the law makers show that the parliament are divided on the bill.
D) Clamorous and dissenting voices of the law makers shows that the parliament are divided on the bill.

193.
A) It had a long strap, and she carried it slung above her shoulder.
B) It had a long strap, and she carried it slung across her shoulder.
C) It had a long strap, and she carried it slung along her shoulder.
D) It had a long strap, and she carried it slung from her shoulder.

194.
A) Rubber tires upon which children had swang in back yards hanged suspended like stopped clock pendulums in blazing air.
B) Rubber tires upon which children had swung in back yards hanged suspended like stopped clock pendulums in the blazing air.
C) Rubber tires upon which children had swung in back yards hung suspended like stopped clock pendulums in the blazing air.
D) Rubber tires upon which children had swang in back yards hanged suspended like stopped clock pendulums in the blazing air.

195.
A) He told me that it was his friend Akib's cardigan which he had forgotten in the class.
B) He told me that it was his friend's Akib cardigan which he had forgotten in the class.
C) He told me that it was his friend Akib's cardigan which he has forgotten in the class.

D) He told me that it was his friend's Akib's cardigan which he has forgotten in the class.

196.

A) He could make dash from it down the hall.
B) He could make a dash through it down the hall.
C) He could make dash for it down the hall.
D) He could make a dash for it down the hall.

197.

A) He had no private means and no family connections of any all conditions.
B) He had not private mean and no family connections of any all conditions.
C) He had not private means and no family connections of any all conditions.
D) He had no private means and not family connections of any all conditions.

198.

A) The woman did not ask the boy something about where he lived, or his folk, or anything else that would embarrass him.
B) The woman did not ask the boy anything about where he lived, or his folk, or anything else that would embarrass him.
C) The woman did not ask the boy anything about where he lived, or his folks, or anything else that would embarrass him.
D) The woman did not ask the boy something about where he lives, or his folk, or anything else that would embarrass him.

In each of the following questions, four alternative meanings of a word are given. You have to select the NEAREST CORRECT MEANING of the given word and fill the appropriate Circle on the MCQ Response Form.

199. Comprehension
A) ken B) jeopardy C) penury D) suspicion

200. Captivated
A) perturbed B) offended C) reckoned D) mesmerized

201. Dispute
A) contravention B) felicity C) circumspection D) panache

202. casually
A) meticulously B) gingerly C) curiously D) nonchalantly

203. Crudely
A) clumsily B) entirely C) forcefully D) abruptly

In each of the following questions, four alternative meanings of a word are given. You have to select the opposite in meaning of the given word and fill the appropriate Circle on the MCQ Response Form.

204. Curious
A) indifferent B) interested C) influenced D) tempted

205. Confirm
A) pledge B) redeem C) assert D) invalidate